Office Action Summary	Application No.	Applicant(s)	
	10/804,592	GALBRAITH, WILLIAM	
	Examiner	Art Unit	
	MELANIE YU	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 24-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 24-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments filed 31 July 2008 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1, 2, 4, 6 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjohölm et al. (US 4,061,466) in view of Spring et al. (US 5,643,721) further in view of Degen et al. (US 5,567,615).

Sjohölm et al. teach an apparatus comprising an insoluble support (cross linked agarose or microparticles) having a ligand of bromosulfophthalein, which is capable of being bindable to albumin, attached thereto (bromosulphophthalein is bromosulfophthalein) without being exposed to albumin (particles are capable of

absorbing albumin, but are not present when bromosulphophthalein is attached to the particle, example 9, col. 9, lines 34-43). Sjohölm et al. fail to teach the ligand attached to the support via an epoxy linkage.

Spring et al. teach ligands attached to an agarose substrate by an epoxy linker may be an agarose substrate (col. 5, lines 50-55), in order to provide a mixture that dries in a film form on the surface to which it is applied.

Degen et al. teach a ligand having a hydroxyl group (col. 12, line 46) attached to a polymer support via an epoxy linker (col. 12, lines 41-47) and therefore teach attachment of a ligand that is epoxy-activated (epoxy linker activates the support, col. 13, lines 44-46), in order to provide attachment of ligands to a polymer substrate.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the apparatus of Sjohölm et al., an epoxy linkage between the ligand and the agarose support as taught by Spring et al., in order to provide a simple method of attaching ligands having a hydroxyl group to a substrate by way of a spontaneous covalent attachment as taught by Degen et al. Degen et al. do not specifically teach a bromosulphophthalein ligand being attached to an agarose support. However, Degen et al. teach that epoxy linker attachment is advantageous for ligands having a hydroxyl group and Spring et al. teach that an epoxy linker is advantageous to link ligands to an agarose support. Since bromosulphophthalein comprises a hydroxyl group, Degen et al. teach the epoxy linkage would be a simpler and advantageous method of attachment of bromosulphophthalein to a substrate, and Spring et al. teach that it would have been obvious for the substrate that the epoxy

linker attaches to, to be an agarose support. Therefore an epoxy linker is advantageously used to attach the ligand to the agarose substrate of Sjohölm et al.

With respect to claims 2, 4, 6 and 25-27, Sjohölm et al. teach the support contained within a container (particles are in a container, col. 4, lines 60-67) and the container being a bottle (beaker is a bottle, col. 8, lines 23-26). Sjohölm et al. also teach the support being a matrix (polyethylene glycol is a matrix and entrapped in the particles, col. 9, lines 39-43).

2. Claims 1-6 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grahnén et al. (The preparation of Ligandin with Glutathione-S-Transferase Activity from Porcine Liver Cytosol by Affinity Chromatography on Bromosulphophthalein-Sepharose, 1977, Eur. J. Biochem., Issue 80, pages 573-580) in view of Spring et al. (US 5,643,721) further in view of Degen et al. (US 5,567,615).

Grahnén et al. teach an apparatus comprising an insoluble support (sepharose column) having a ligand consisting of bromosulfophthalein attached thereto, which is capable of being bindable to albumin, without being exposed to albumin (pg. 574, section: *Preparation of Bromosulphophthalein Affinity Column*) in view of Degen et al. (US 5,567,615). Grahnén et al. fail to teach the ligand attached to the support via an epoxy linkage.

Spring et al. teach ligands attached to an agarose substrate by an epoxy linker may be an agarose substrate (col. 5, lines 50-55), in order to provide a mixture that dries in a film form on the surface to which it is applied.

Degen et al. teach a ligand having a hydroxyl group (col. 12, line 46) attached to a polymer support via an epoxy linker (col. 12, lines 41-47) and therefore teach attachment of a ligand that is epoxy-activated (epoxy linker activates the support, col. 13, lines 44-46), in order to provide attachment of ligands to a polymer substrate.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the apparatus of Grahnén et al., an epoxy linkage between the ligand and the agarose support as taught by Spring et al., in order to provide a simple method of attaching ligands having a hydroxyl group to a substrate by way of a spontaneous covalent attachment as taught by Degen et al. Degen et al. do not specifically teach a bromosulphophthalein ligand being attached to an agarose support. However, Degen et al. teach that epoxy linker attachment is advantageous for ligands having a hydroxyl group and Spring et al. teach that an epoxy linker is advantageous to link ligands to an agarose support. Since bromosulphophthalein comprises a hydroxyl group, Degen et al. teach the epoxy linkage would be a simpler and advantageous method of attachment of bromosulphophthalein to a substrate, and Spring et al. teach that it would have been obvious for the substrate that the epoxy linker attaches to, to be an agarose support. Therefore an epoxy linker is advantageously used to attach the ligand to the agarose substrate of Grahnén et al.

With respect to claims 2-6 and 25-27, Grahnén et al. teach that the insoluble support is contained in and supported in a column (affinity column with bromosulphophthalein as a ligand, pg. 574, section: *Preparation of Bromosulphophthalein Affinity Column*; and pg. 575, right column, last 2 paragraphs).

3. Claims 24 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pieper et al. (US 2002/0127739) in view of Grahnén et al. (The preparation of Ligandin with Glutathione-S-Transferase Activity from Porcine Liver Cytosol by Affinity Chromatography on Bromosulphophthalein-Sepharose, 1977, Eur. J. Biochem., Issue 80, pages 573-580) further in view of Spring et al. (US 5,643,721) and Degen et al. (US 5,567,615).

Pieper et al. teach a column comprising one or more additional supports capable of binding one or more non-albumin proteins (par. 0067), wherein the supports include one or more supports capable of binding IgA and IgG (different matrices carrying different binding agents to remove proteins from a sample is provided at par. 0067; sample proteins of IgG and IgA are non-albumin and are listed at pg. 9, Table 1). Pieper et al. fail to teach a ligand of bromosulfophthalein.

Grahnén et al. in view of Spring et al. further in view of Degen et al., as applied to claim 1, teach a ligand comprising bromosulfophthalein attached to an insoluble support a column (pg. 574, section: *Preparation of Bromosulphophthalein Affinity Column*) via an epoxy linker (Spring and Degen) which produces an epoxy-activated support (Degen), in order to bind albumin.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the column of Pieper et al., a binding agent of bromosulfophthalein as taught by Grahnén et al. in view of Spring et al. further in view of Degen et al., in order to provide a detectable ligand specific to albumin, which

strongly influences the affinity of albumin to the ligand and provides detectable properties upon binding which ensures removal.

Regarding claims 30 and 31, Pieper et al. teach a support bindable to IgA (proteins for which a multi-component antibody affinity matrix are listed at pg. 9, Table 1; IgA has a separate column body par. 0102) and a support bindable to IgG (proteins for which a multi-component antibody affinity matrix are listed at pg. 9, Table 1; IgG has a separate column body par. 0102) wherein the support comprises protein A and G cartridge (a column comprising protein G and A bind IgG; see under Table 1).

Response to Arguments

4. Applicant's arguments filed 31 July 2008 have been fully considered but they are not persuasive. Applicant argues that Sjohölm et al. teach a three-dimensional network with particles containing a biologically active substance entrapped in the meshes of the network, and the substance of Sjohölm et al. is required to be composed of macromolecules which are capable of being entrapped in the cross-linked polymer system. Applicant argues that therefore Sjohölm et al. fail to teach the use of an epoxy-activated insoluble support and instead relies on physically entrapping biologically active macromolecules to perform the binding process. Applicant further argues that since Sjohölm et al. teach the use of biologically-active macromolecules which are entrapped in a cross linked support, an alteration of rendering the support epoxy-activated for binding would completely alter the function of the support of Sjohölm et al. which is contrary to the explicit requirements for establishing a *prima facie* case of obviousness. Applicant's argument is not persuasive because Sjohölm et al. is not

relied upon for teaching a substrate having an epoxy-linkage, Spring et al. and Degen et al. are relied upon for teaching this limitation. Applicant's argument regarding Sjohölm et al. only teaching entrapping macromolecules and not teaching attaching the bromosulfophthalein to the agarose is not persuasive because at example 9 (col. 9, lines 33-43), Sjohölm et al. teach coupling bromosulfophthalein to a cross linked agarose support as an alternative embodiment to entrapping the bromosulfophthalein within the cross linked agarose. Therefore coupling the bromosulfophthalein of Sjohölm et al. via a different linkage (e.g. an epoxy linkage) as taught by Spring et al. and Degen et al., would not alter the function of Sjohölm et al. One having ordinary skill in the art would have a reasonable expectation of success because Sjohölm et al. teach coupling a bromosulfophthalein to an agarose support and Spring et al. and Degen et al. teach a different type of linkage between a ligand and an agarose support. It would have been obvious and does not alter the attachment or function of Sjohölm et al. to substitute the existing coupling between bromosulfophthalein and the agarose support with a different linkage.

5. Applicant argues that Grahnén et al. requires cross-linked sepharose which is functionally different from the claimed epoxy-activated insoluble support. Applicant argues that modifying the cross-linked sepharose with an epoxy linkage would impermissibly alter the principle of the operation of Grahnén et al. Applicant's argument is not persuasive because the rejection is based on providing the cross-linked sepharose as taught by Grahnén et al. with an epoxy linker as taught by Spring et al. and Degen et al. for attaching the bromosulfophthalein of Grahnén et al. The claims do

not exclude the presence of a cross linked agarose and modifying the cross linked sepharose of Grahnén et al. with an epoxy activation does not alter the operation of Grahnén et al. or replace the presence of the cross linked agarose which is applicant argues is required.

Conclusion

6. No claims are allowed.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELANIE YU whose telephone number is (571)272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on (571) 272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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